



**WORK PLAN ADDENDUM NO. 4  
REMOVAL ACTIONS  
FORMER NAVAL TRAINING CENTER - BAINBRIDGE  
PORT DEPOSIT, MARYLAND**

**CONTRACT NO. N62470-93-D-3032 – D.O. 137  
CONTRACT NO. N62470-97-D-5000 – D.O. 043**


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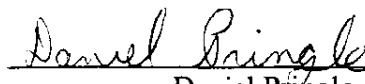
DEPARTMENT OF THE NAVY  
Atlantic Division  
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EFA Chesapeake - NAVFACENGCOM  
901 M Street, S.E., Building 212  
Washington, DC 20374-5018

Prepared by:

OHM Remediation Services Corp.  
2790 Mossie Boulevard  
Monroeville, Pennsylvania 15146

Reviewed by:

  
\_\_\_\_\_  
Lawrence J. Stearns, P.E.  
Sr. Project Manager

  
\_\_\_\_\_  
Daniel Pringle  
Senior Engineer

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OHM Projects 919568 and 798939

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## ***LIST OF ACRONYMS***

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BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
DDT-R	Summation of DDD, DDE and DDT
D.O.	Delivery Order
DRO	Diesel Range Organics
ENSYS	Strategic Diagnostics Inc.
EOD	Explosive Ordnance Disposal
GRO	Gasoline Range Organics
mg/kg	Milligrams per Kilogram
NTCB	Former Naval Training Center Bainbridge
OHM	OHM Remediation Services Corporation
PID	Photoionization Detector
ppm	parts per million
RPM	Remediation Program Manager
TAL	Target Analyte List
TAT	Turn-around-time
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbon
UST	Underground Storage Tank
UXO	Unexploded Ordnance
XRF	X-ray Fluorescence
yd <sup>3</sup>	cubic yard
>	greater than
<	less than

## ***1.0 INTRODUCTION***

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OHM Remediation Services Corp. (OHM), was contracted by the Navy to perform various soil removal actions as part of the on-going site cleanup effort at former Naval Training Center Bainbridge (NTCB). The work discussed in this addendum will be performed under Contract N62470-97-D-5000, Delivery Order (D.O.) #43. Previous work as discussed in the earlier addendums and modifications to this work plan was conducted under Contract N62470-93-D-3032, D.O. #137.

The new work to be conducted at the Building 683 - Pesticide Shop and Building 707 Area is a continuation of work addressed in the Work Plan Addendum Nos. 2 and 3. Detailed procedures for the general work activities for these projects can be found in the June 22, 1999 Work Plan Addendum No. 3, the December 22, 1998 Work Plan Addendum No. 2, and in the original April 18, 1997 Work Plan. This new Work Plan Addendum No. 4 addresses specific work activities for the following sites:

- Pesticide Shop – Building 683: Groundwater investigation
- Pesticide Shop – Building 683: Removal of pesticide impacted soils
- Small Arms Ranges – Buildings 204, 304, and 404: Removal of lead impacted soils
- Building 707 Area: Removal of lead impacted soils
- Summit Circle Housing Area: Removal of 24 underground storage tanks
- Hospital Area – Buildings 855 and 859: Removal of 3 platform mounted transformers

The location of these work sites at NTCB is shown on Figure 1. The field work for this addendum will be scheduled using a 6-day per week and 10-hours per day work schedule throughout the remaining project duration. OHM will use Sundays as necessary to maintain the critical schedule desired by the Navy. The key contacts for this project include:

OHM Project Manager  
Larry Stearns  
The IT Group  
2790 Mosside Boulevard  
Monroeville, PA 15146-2792  
(412) 380-6250 Voice  
(412) 380-0699 Fax

Navy Remedial Project Manager (RPM)  
Frank Zepka  
EFA-Chesapeake – Code 1812  
NAVFACENGCOM – Building 212  
901M Street S.E.  
Washington, D.C. 20374-5018  
(202) 685-3279 Voice  
(202) 433-7018 Fax

## ***2.0 SCOPE OF WORK AND OBJECTIVES***

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A summary of the basic scope of field work for the various sites is addressed below. Further details are provided in Section 3.0 of this Addendum. During the removal activities, situations may present themselves that may cause a modification to the schedule or work scope. These modifications will be discussed and approved by the Navy prior to proceeding. OHM does not plan on updating this work plan addendum unless there is a significant scope increase or revision. Lesser changes to this plan will be addressed with attached memorandums.

### **Pesticide Shop – Building 683 – Source Removal Action [Reference Figure 2]**

- Excavation and stockpiling of clean overburden soil
- Field kit testing for DDT-R to guide impacted soil excavation work
- Excavation and stockpiling of pesticide impacted soils
- Offsite transportation and disposal of impacted soils, liquids, and PPE
- Post excavation field kit verification testing for DDT-R and TPH
- Post excavation laboratory confirmation testing for cleanup criteria
- Site backfilling, re-grading, seeding and mulching

### **Pesticide Shop – Building 683 – Groundwater Investigation [Reference Figure 3]**

- Collect groundwater samples at approximately 12 locations near Building 683
- Collect perched water samples when encountered
- Collect soil samples to support lithology description, modeling, and investigation
- Field kit testing for DDT-R of soil samples
- Laboratory analytics for groundwater samples

### **Buildings 204, 304, 404, and 707 – Lead Impacted Soil Removals [Reference Figures 4, 5, 6, 7]**

- Sample collection and X-ray Fluorescence (XRF) testing for identifying impacted soils
- Sample collection and XRF testing for sorting impacted soils piles for disposal
- Excavation, stockpiling and sampling of lead-impacted soils
- Off-site transportation and disposal of hazardous and non-hazardous wastes
- Post excavation sampling for XRF and laboratory confirmation analyses
- Site re-grading, seeding and mulching

### **Summit Circle Housing Area UST Removals**

- Remove contents of storage tanks for disposal
- Removal of storage tanks and adjacent impacted soils
- Cutting storage tanks for scrap disposal
- Off-site transportation and disposal of impacted soils and liquids
- Backfill, seed and mulch excavations

### **Hospital Area – Buildings 855 and 859 - Transformer Retrieval**

- Retrieve 3 transformers and record serial numbers
- Off-site disposal of transformers as scrap metal

## **2.1 SEQUENCE OF ACTIVITIES**

The field work for these removal actions is expected to require 6 weeks starting 7-Sep-99. The sequence of activities is determined by the Site Supervisor with the approval of the Project Manager. However there may be gaps in the work continuity while awaiting analytical results, regulatory reviews and approvals, or resolution of scope issues. The general sequence of activities may be modified as necessary with the approval of the Project Manager to minimize delays and maximize productivity.

## **2.2 CLEANUP CRITERIA**

The project cleanup criteria for the various removal action sites is given in Table 1. The laboratory confirmation and verification sample results will be compared to Table 1 values.

<b>Table 1 Cleanup Criteria</b>			
<b>Removal Action Site</b>	<b>Chemical of Concern</b>	<b>Cleanup Criteria (mg/kg)</b>	<b>SW-846 Test Method</b>
Pesticide Shop – Building 683	DDT	4.3	8081
Pesticide Shop – Building 683	DDE	16.3	8081
Pesticide Shop – Building 683	DDD	23.1	8081
Pesticide Shop – Building 683	Alpha Chlordane	4.1	8081
Pesticide Shop – Building 683	Gamma Chlordane	4.1	8081
Pesticide Shop – Building 683	Heptachlor Epoxide	0.4	8081
Building 204, 304, 404, 707	Lead	400	6010
Summit Circle USTs	Total Petroleum Hydrocarbon	100	8015

## **2.3 FIELD VERIFICATION APPROACH**

Verification tests will be used to determine when the Table 1 cleanup criteria have likely been achieved and to indicate when laboratory confirmation samples should be collected. To guide the impacted soil excavation work at the Building 683 – Pesticide Shop, field screening kits will be used for DDT-R and TPH. If the results of the field screening for DDT-R are greater than 10 ppm, then additional excavation will be conducted. If field screening results are less than 10 ppm, then excavation will stop and laboratory confirmation analyses will be performed as described in Section 2.4 below.

At the lead impacted soil sites [Buildings 204, 304, 404, and 707], field screening will be performed on-site with an XRF analysis. If the XRF results are greater than 400 ppm total lead, then additional excavation will be conducted. If the XRF results are less than 400 ppm, then excavation will stop and laboratory confirmation analyses will be performed.

## **2.4 LABORATORY CONFIRMATION APPROACH**

Laboratory confirmation analyses will be compared to the Table 1 cleanup criteria to determine when a site has been remediated.

At the Summit Circle Area, after removing the underground storage tanks, two floor soil samples per

excavation will be tested for TPH-DRO-GRO at a laboratory with 3-day turn-around-time and Level C NFESC quality control package.

At the Pesticide Shop – Building 683 remediation, one floor sample will be collected per 60' by 60' area for confirmation analyses, and sent to the laboratory for Total Pesticides (Method 8081) and TPH (Method 8015 Modified). One sample will also be collected and similarly tested for each 60-linear feet of wall by 2-foot vertical height (120 sft) in areas that were contaminated.

At the lead impacted soil removal sites [Buildings 204, 304, 404, and 707], confirmation sampling will be performed within an approximately 50' by 50' grid block. Three individual floor grab samples will be collected from the three "hottest" grids that were previously determined by the XRF investigation. These three grab samples will then be field screened using the XRF Analyzer.

If the XRF field screening result is < 400 ppm lead for all three floor grabs, then a fourth floor grab sample will be collected from a randomly selected grid within the 50' by 50' block, to be tested with the XRF unit before being sent to the laboratory for confirmation testing by Total Lead (Method 6010, 3 day TAT

If XRF field screening is > 400 ppm lead for any of the three floor grabs, then for excavation purposes all of the adjacent 10' by 10' grids for each of the floor grabs above 400 ppm lead will be XRF field screened. Supplemental excavations will be 6 to 12-inches deep based on field screening results and field judgement.

Also at the lead impacted soil removal sites [Buildings 204, 304, 404, and 707], one wall sample will be collected every 50 linear feet along the exterior perimeter for any excavation of two feet or less, and will be tested by XRF field screening. ).

Also at the lead impacted soil removal sites [Buildings 204, 304, 404, and 707], five grab samples per building location will be collected at random grids in the remediation areas for laboratory analysis for Target Analyte List (TAL) Metals (Method 6010/7471). All laboratory analytics will include a Level C NFESC quality control package. Duplicate samples will be tested on 20-percent of laboratory and XRF tests.



## ***3.0 SITE WORK ACTIVITIES***

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The following sections discuss the field work to be performed for D.O. No. 43 under the new contract. Additional information and procedures can be found in the previously submitted documents referenced in Section 2.0.

### **3.1 PESTICIDE SHOP - BUILDING 683**

This addendum addresses both investigative work and removal activities at Building 683. The objective of the investigative work will be to collect subsurface information in order to preliminarily determine if groundwater has been impacted by the pesticide contamination. The removal activities are a continuation of previous work at the site with some modifications to the removal procedures. Specific information for these tasks is presented in the following sections.

#### **3.1.1 Subsurface Investigation**

A subsurface soil and groundwater investigation is proposed for the vicinity of the former Pesticide Shop – Building 683. A previous investigation indicated pesticides in one soil sample 12 feet BGS. OHM will collect and analyze soil and groundwater samples in order to confirm the extent of pesticides in the vicinity of the Former Pesticide Shop.

A total of 12 boring locations performed by direct-push technique (e.g., Geoprobe Method) to a depth of approximately 50 feet are proposed as shown on Figure 3. Two zones of groundwater may be encountered: a perched zone at approximately 13 feet and a prominent aquifer at approximately 50 feet. Groundwater samples will be collected where encountered. Soil samples will be collected continuously from the ground surface to approximately 50 feet at approximately 6 locations. Soil will be described and logged on a geologic boring record and screened for headspace analysis using a photoionization detector (PID). Soil samples will be selected for field screening by DDT-R and TPH field test kits.

Laboratory analysis for groundwater samples will include the following:

- Pesticides – Method 8081
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) – Method 8260B
- Total Petroleum Hydrocarbons (TPH) – Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) – Method 8015 Modified
- Turbidity – Method EPA600 180.1

Sample collection logs will be completed for all soil and groundwater samples collected along with the appropriate chain-of-custody records for groundwater samples shipped off-site for analysis.

After all samples are taken, the temporary boreholes will be backfilled with granular bentonite. Any damage to underground or surface utilities and surface pavement will not be repaired. All soil, water and disposable equipment and PPE will be drummed and stored on site until laboratory analytical testing is complete. Based on the laboratory results, drums will then be properly disposed of. All work will be conducted in Modified Level D (tyvek suite, steel-toed boots, safety glasses, and hard hat) at a minimum.

### **3.1.2 Remedial Action**

The remedial action at the Pesticide Shop - Building 683 will involve the continued removal of pesticide contaminated soils. The additional contaminated soil removal will concentrate in the area of the subsurface pipe alignment shown on Figure 2. This pipe is located approximately six feet below the ground surface and appears to have numerous leakage points causing further pesticide contamination below the pipe. At present the extent of vertical and horizontal pesticide contamination at Building 683 is not known.

In order to remediate the contaminated soil below the pipe, OHM will first strip off and stockpile the top 6 feet (down to the depth of the pipe) of the uncontaminated soil. The lateral limits of this removal are shown on Figure 2. Excavation will begin in the 15 adjacent grids (20' by 20') to G6, G7 and G8 as indicated in Figure 2. The top layer at 0 to 6 feet BGS will be striped and stockpiled as clean overburden.

Once this overburden material is excavated and stockpiled on site for reuse, the sampling crew will begin sampling and field screening within the excavation in 2 feet vertical increments. OHM will continue to excavate soil in two feet vertical increments and stockpile this soil (one stockpile for each two feet vertical lift) on plastic sheeting for sampling and field screening. The resulting analysis will determine if the soil stockpiles will be used as backfill or if they will require off-site disposal. The sampling procedures are discussed in Section 3.1.3 of this addendum.

### **3.1.3 Verification Sampling and Analysis**

At the 6 feet depth, one 3 point composite will be collected from each 20' by 20' grid and field screened using the Strategic Diagnostics, Inc. (ENSYS) immunoassay kits calibrated to 0.2, 1.0 and 10.0 ppm of DDT-R in soils, with these guidelines:

Screening Result < 1 ppm	Material is placed in a clean overburden pile
Screening Result > 1, < 10 ppm	Material is placed in a separate pile for laboratory verification analysis
Screening Result > 10 ppm	Material is placed in a separate pile for off-site disposal

In the 6 to 8 feet and the 8 to 10 feet layers BGS, a 3 point composite will be collected from each 20' by 20' grid and field screened for DDT-R. Soil excavation for these subsequent layers will be the same as for the 0 - 6 feet BGS layer.

The "contaminated zone" tentatively occurs in the 10 to 12 feet BGS (and possibly deeper) layer. For each incremental foot of depth beyond 10 feet, one 3 point composite will be collected from each 20' by 20' grid and field screened for DDT-R. The field screening results will determine how the material is to be handled.

Grids screening < 10 ppm DDT-R will also be screened for TPH. A "clean" condition for TPH is < 100 ppm. Sidewall sampling will take place in the contaminated zone layer by collecting one grab sample per 40 lateral feet adjacent to a removed contaminated zone. Excavation and stockpiling will continue both vertically and laterally until screening results are below the Table 1 cleanup criteria.

### **3.1.4 Confirmation Analysis**

From areas determined clean by DDT-R screening, one soil grab sample per 60' by 60' area will be

collected from the floor, (as well as from the piles requiring laboratory verification) and will be sent to the laboratory for confirmation analysis for Total Pesticides (Method 8081) and TPH (Method 8015 Modified) on a 3 day turn-around-time (TAT). This confirmation procedure is consistent with that developed and approved for the Addendum No. 3 work. In addition, one wall sample will be collected per 60-linear feet by 2-foot high lift (120 sft) for similar laboratory analyses.

### **3.2 LEAD SOIL REMEDIATION - BUILDINGS 204, 304 404, AND 707**

Prior to the excavation activities at these locations, a series of 24 soil samples will be collected in an effort to establish a correlation between Total Lead (Method 6010), Toxicity Characteristic Leaching Procedure (TCLP) for Lead (Method 1311/6010), and field XRF total lead testing. The generated curve will be used to guide segregation of removed soils into piles of non-hazardous verses hazardous wastes for disposal.

#### **3.2.1 Building 204**

Lead impacted soil at Building 204 comprises approximately 676 grids (10' by 10') as indicated in Figure 4. Additional soil samples will be collected and field screened using the TN Technologies Spectrace 9000 XRF Analyzer to further define the delineation of lead-impacted soil at Building 204.

Using the correlation data of Total/TCLP Lead from the laboratory, impacted soil material from Building 204 (greater than 400 ppm lead) will be selectively excavated to be combined with material from grids with similar lead levels based on the previous XRF investigation. The soils will be segregated into approximately 100 cyd piles. This correlates to soil collected from 25 grids. When possible, these will be arranged in a 5 by 5 grid block pattern.

Waste disposal characteristics sampling for the 100 cyd segregated piles will be conducted by collecting a 5-point composite from the pile, XRF field screening for lead. If in the judgement of the Senior Chemist the distinction between hazardous and non-hazardous lead concentrations is uncertain, then a sample will be collected for laboratory TCLP testing for lead (Method 1311/6010 with 3 day TAT). Every approximately 1,500 cyd (approximately every 15<sup>th</sup> pile), a sample will be collected for a full set of laboratory disposal analytics.

#### **3.2.2 Building 304**

Lead impacted soil at Building 304 comprises approximately 60 grids (10' by 10') as indicated in Figure 5. The excavation and confirmation sampling procedure will be the same as for Building 204, with the following exceptions:

- Excavation depth will be two feet instead of one foot
- Material for the 100 cyd segregated piles will come from approximately 13 grids.

#### **3.2.3 Building 404**

Lead impacted soil at Building 404 comprises approximately 286 grids (10' by 10') as indicated in Figure 6 along with a small sand pile (< 20 cyd). Additional soil samples will be collected and field screened

using the TN Technologies Spectrace 9000 XRF Analyzer to further define the delineation of lead-impacted soil at Building 404. Excavation and confirmation sampling procedures will be the same as for Building 204.

Due to the potential presence of rifle casings and other unexploded ordnance (UXO), the sand within this pile will require physical screening to remove any potential casings or UXO. This work will be conducted by hand using shovels and ¼-inch screen. This operation will be supervised by an on-site explosive ordnance disposal (EOD) specialist. The material captured by the ¼-inch screen will then be inspected by the EOD specialist and potential UXO materials removed. These UXO materials will be staged or containerized in a secured area and disposed of according to UXO protocols.

#### **3.2.4 Building 707**

Lead impacted soil at Building 707 comprises approximately 154 grids (8' by 8') as indicated in Figure 7. Excavation and confirmation sampling procedures will be the same as for Building 204, with the following exceptions:

- Excavation depth will be 18 inches (1½ feet) instead of one foot
- Excavation and confirmation sampling will be performed within a 48' by 48' grid (6 by 6 grid block pattern)
- Material for the 100 cyd segregated piles will come from approximately 18 grids.

Site restoration for all lead-contaminated sites will include at a minimum backblading followed by seeding/mulch. Site(s) where the excavations exceed two feet will be backfilled using spoils from the landfill cap followed by seeding/mulch.

### **3.3 UNDERGROUND STORAGE TANK REMOVAL**

A total of 24 underground storage tanks have been located at the Summit Circle Area as indicated in Figure 8. The contents of the tanks, previously characterized as waste heating oil, will be evacuated by a subcontractor for disposal off site. The tanks then will be extracted from the ground under the observation of a Maryland certified tank remover. The tanks will be staged on visqueen, purged (with dry ice, carbon monoxide, or inert nitrogen), cut in half, cleaned, and then disposed of as scrap.

Following the removal of each tank from the ground, two confirmation soil samples will be secured from the floor of each excavation and submitted to the laboratory for analysis of TPH GRO/DRO (Method 8015, Modified) on a 3-day TAT.

Once the excavations have been verified "clean" by the laboratory (< 100 ppm TPH), spoils from the landfill cap will be used to backfill the excavations followed by seeding/mulch.

### **3.4 AREA 8 - HOSPITAL**

Three transformers will require removal from the Hospital Area. These transformers were previously tested by the Navy and found not to contain PCB oils. OHM will be responsible for retrieving the transformers, recording their appropriate serial numbers, and disposing of the transformers as scrap with the UST materials. These are Navy numbers 78-A, B, and C with serial numbers 292358, 292332, and 292328. They are platform mounted between Buildings 855 and 859.

### **3.5 SITE RESTORATION**

Site restoration activities will consist of regrading/backfilling, seeding, and mulching of all disturbed areas. Regrading activities at Buildings 204, 304, 404, and 707 will consist of using a bulldozer to push the sides of the excavation in, in order to create a gentle slope. The Pesticide Shop will be backfilled with spoils material from the Contract N62470-93-D-3032 D.O. 168 landfill repair activities, and the previously stockpiled overburden material. After regrading and backfilling activities are completed, all sites will be seeded and mulched.

## ***FIGURES***

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